



# FEMA

## PROTECTING MANUFACTURED HOMES IN FLOOD HAZARD AREAS

Most of the flooding damage observed in manufactured homes constructed before 1994 can be attributed to lack of adequate elevation, use of un-reinforced piers (dry-stacked blocks) in high flood flow areas, inadequate anchoring, and failure of attached site-built additions. Anchoring failure problems observed in installations include poorly attached anchors, lack of corrosion-resistant materials, homes not anchored tightly against support piers, and improperly attached tie-down straps.

### Methods for Mitigating Flood Hazards

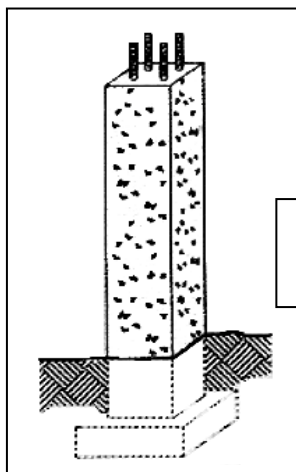
**Always check with your local Building officials first as cities and counties may differ.**

#### Elevation

- Elevation on Fill
- Elevated Foundations
- Pier/Column Foundation
- Pile Foundation
- Extended Foundation Walls



Manufactured home installed on earth fill elevated building pad.



Reinforced Concrete Pier

#### Enclosed Foundations / Open Foundations

- Pier Systems
- Reinforced Piers
- Posts
- Pilings

Example of a Home with diagonal bracing



#### Bracing

- Diagonal bracing
- Knee bracing

## Foundation Enclosures

These are permitted for homes in certain Flood Zones as long as the foundation contains openings to allow automatic entry and exit of floodwaters. This elevation technique can not be used in Flood Zones characterized by high-velocity and/or wave action.

## Footings

Specific requirements for the size and depth of footings based on local soil conditions are provided by local codes.

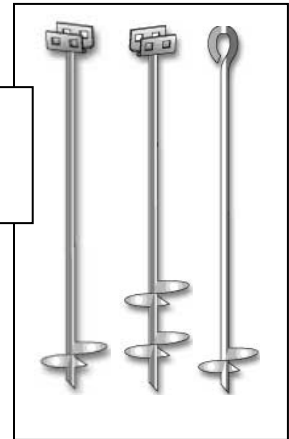
## Anchoring

- Screw Anchors
- Concrete Anchors



Breakaway  
walls

Anchor Head -  
Anchor Shaft -  
Anchor Helix -



## Breakaway Walls

Breakaway walls are designed and constructed to fail under the loads imposed by high-velocity floodwaters, mainly found in coastal areas.

## Design Considerations

The 3-foot rule generally places a manufactured home's floor approximately 4 feet above grade.

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*For more information, refer to the FEMA publication:*

## Manufactured Home Installation in Flood Hazard Areas / FEMA-85

This can be ordered by calling the FEMA Publications Warehouse at 1-800-480-2520